

COLUMNNEA ANTENNIFERA, A NEW SPECIES OF GESNERIACEAE
FROM THE CORDILLERA CENTRAL OF THE COLOMBIAN ANDES

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ABSTRACT

A recent expedition to the Cordillera Central of the Colombian Andes resulted in the discovery of a new species of *Columnea* (Gesneriaceae, tribe Episcieae). The new species, ***Columnea antennifera*** J.L. Clark & Clavijo, is distinguished from other congeners by the presence of elongate corolla appendages that alternate with the corolla lobes, anisophyllous leaves, and a scandent obligate epiphytic habit. A discussion and images are provided to differentiate *Columnea antennifera* from *C. dissimilis*, *C. filamentosa*, and *C. rosea*. The characteristic of elongate corolla appendages is discussed and *Columnea antennifera* is compared with other taxa that share this unusual feature.

RESUMEN

Una reciente expedición al norte de la Cordillera Central de los Andes Colombianos permitió el descubrimiento de una nueva especie de *Columnea* (Gesneriaceae, tribu Episcieae); ***Columnea antennifera*** J.L. Clark & Clavijo, que se distingue de otras especies del género por la presencia de apéndices alargados alternos a los lóbulos de la corola, hojas anisófilas y hábito epífita escandente obligado. Se presentan fotografías y una discusión para diferenciar *Columnea antennifera* de *C. dissimilis*, *C. filamentosa* y *C. rosea*. Se discute la presencia de apéndices alargados en la corola de *Columnea antennifera* y se compara con otras especies que comparten este carácter inusual.

KEY WORDS: *Columnea*, Colombia, Episcieae, Gesneriaceae, Taxonomy

INTRODUCTION

The genus *Columnea* L. is primarily epiphytic and belongs to the New World subfamily Gesnerioideae and tribe Episcieae. *Columnea* ranges from Mexico south to Bolivia and is most diverse in the northern Andes of Colombia and Ecuador. With over 200 species, *Columnea* is the largest genus in the subfamily Gesnerioideae (Burtt & Wiehler 1995; Weber 2004; Skog & Boggan 2006). The genus is distinguished from other closely related genera by an indehiscent berry instead of a fleshy bivalved capsule.

Columnea antennifera J.L. Clark & Clavijo was discovered during a 2012 research expedition to the Colombian department of Antioquia in the Cordillera Central of the northern Andes. A remarkable character of *Columnea antennifera* is the presence of five elongate appendages near the corolla sinuses. The presence of corolla appendages and where they appear has been discussed in numerous artificial classifications of groups now recognized as *Columnea*, such as the section *Ortholoma* Benth. and the genus *Trichantha* Hook. (Morton 1963, 1971; Morley 1976; Smith 1994). Corolla appendages have not been thoroughly evaluated in a phylogenetic context and most likely this character is convergent within *Columnea*.

Columnea antennifera J.L. Clark & Clavijo, sp. nov. (**Fig. 1**) TYPE: COLOMBIA. ANTIOQUIA: Municipio Valdivia, Cordillera Central, road Ventanas to Briceño, before the quebrada El Oro, 07°05'20"N, 75°29'20"W, 1802 m, 19 May 2012 (fl), J.L. Clark, J. Anderson, L. Clavijo, M. Mazo & D. Suescún 13036 (HOLOTYPE: COL; ISOTYPES: BRIT, HUA, MO, NY, UNA, US).

Differs from all other *Columnea* by the combination of the presence of broad calyx lobes, elongate appendages near corolla sinuses, obligate scandent epiphytic habit, and strongly anisophyllous opposite leaves.

Obligate scandent epiphytic climber; stems elongate and horizontal, 2–3 m long, suffrutescent, glabrescent below, sparsely pilose above. **Leaves** opposite, strongly anisophyllous in a pair; larger leaf with petioles terete, 4–10 mm long, blade coriaceous when dry, elliptic to oblong, 3–12 × 1.3–3.4 cm, base rounded to oblique,

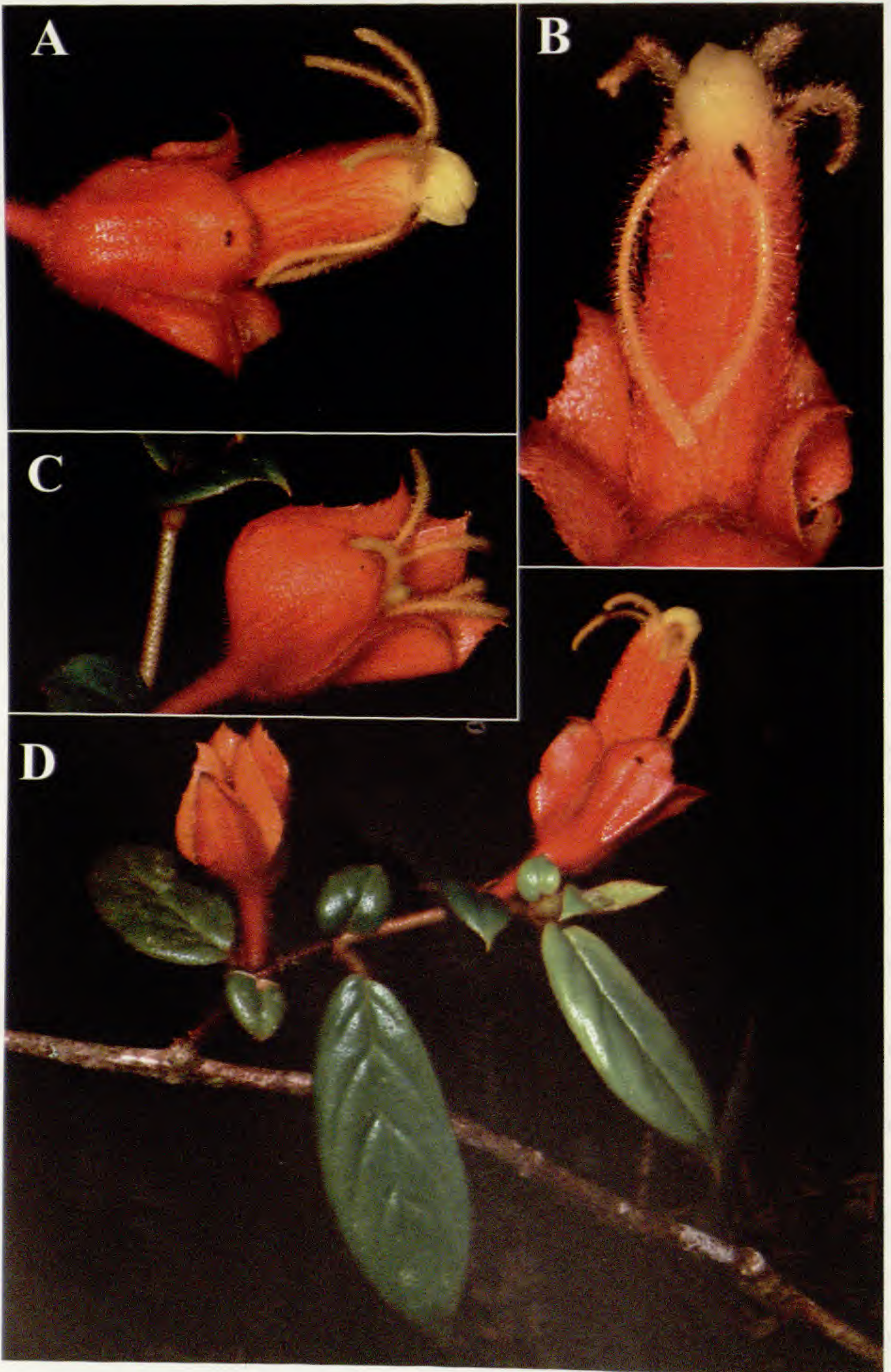


FIG. 1. *Columnea antennifera* J.L. Clark & Clavijo. A. Lateral view of flower. B. Front view of flower. C. Immature flower showing corolla appendages. D. Habit showing elongate stems and strongly anisophyllous leaf arrangement. (A–D from the holotype, J.L. Clark et al. 13036).

sometimes asymmetrical, apex acute, margin entire, adaxially shiny green, abaxially light green, sparsely pilose on upper surface and densely pilose on lower surface; smaller leaf greatly reduced relative to larger leaf, nearly sessile, orbicular to ovate, 1–2.7 × 0.5–1.5 cm, base rounded to cordate, apex acute, margin entire, surfaces and vestiture similar to larger leaf. **Flowers** solitary and erect; pedicels 1.3–2 cm long, red, pilose; calyx 2–3.5 cm long, uniformly bright red, inside and outside sparsely pilose, inside lanate at the base, lobes 5, erect at anthesis, each lobe tightly appressed to adjacent lobe and folded lengthwise, ovate, apex broadly acuminate, margin entire, 4 lobes nearly equal 0.7–1 × 1.2–1.5 cm, fused at the base for 1.5–2.6 cm, 5th lobe (dorsal) slightly smaller, fused at the base for 1.1–1.5 cm; corolla tubular, posture erect in calyx, 3.0–4.5 × 0.6–1.0 cm; outside uniformly bright red and tomentose, internally glabrate, lobes bright yellow, appressed, 5–6 × 2–2.5 mm, ovate; corolla appendages present in immature and mature flowers, located in each sinus alternate the corolla lobes, 14–20 mm long, pilose, bright yellow with or without a dark spot at the base; stamens 4, didynamous, included; filaments 12–15 mm long, coiled after anthesis, connate and adnate to the base of the corolla tube, glabrous; anthers connate, longer than broad, 2–2.5 × 1–1.5 mm, dehiscing by longitudinal slits; staminode not seen; nectary a dorsal gland, glabrous; ovary superior, lanate, ca. 5 × 4 mm, style ca. 30 mm long, glabrous, stigma included and capitate. **Fruits** not seen.

Columnea antennifera is morphologically similar to *C. dissimilis* C.V. Morton (Fig. 2, A–D). These two species are easily differentiated by the elongate corolla appendages in *Columnea antennifera* (Fig. 1) in contrast to the relatively short corolla appendages in *C. dissimilis* (Fig. 2A). The corolla appendages are developed in immature flowers of *Columnea antennifera* (Fig. 1C). In contrast, the corolla appendages in *Columnea dissimilis* are either absent or significantly reduced when the flowers are immature (Fig. 2B). Another species that has corolla appendages and is morphologically similar to *C. antennifera* is *C. filamentosa* (Figs. 2E, F). These two species are readily differentiated by the uniformly red corolla in *Columnea filamentosa* (Fig. 2E) in contrast to the red corolla with bright yellow lobes in *C. antennifera* (Fig. 1). Vegetatively these two species are differentiated by the isophyllous leaf arrangement in *Columnea filamentosa* in contrast to the strongly anisophyllous *C. antennifera*. A third species that has corolla appendages is *Columnea rosea* (C.V. Morton) C.V. Morton (Fig. 3E). However, the calyx lobes of *Columnea rosea* are deeply serrate to fimbriate (Fig. 3E) in contrast to the entire calyx margins of *C. antennifera* (Fig. 1).

Distribution and habitat.—*Columnea antennifera* is known from the northern Cordillera Central of the Colombian Andes in the department of Antioquia from montane forests (1800 m). Herbarium collections of *Columnea antennifera* were not seen during recent visits to the National University of Colombia (COL) or the University of Antioquia (HUA), but an additional population was observed and photographed near the type locality between Yarumal and Ventanas during a 1996 field expedition by Günter Gerlach from the Munich Botanical Garden (Botanischer Garten München-Nymphenburg).

Etymology.—The specific epithet, *antennifera*, refers to the resemblance of the elongate appendages at the apex of the corolla tube to insect antennae.

Classification.—*Columnea antennifera* appears to belong to section *Ortholoma* Benth. because of the presence of corolla appendages and an obligate epiphytic habit. However, the traditional sectional classification of *Columnea* is artificial and arbitrary. As an example, the section *Ortholoma* has been recognized at the generic level as *Trichantha* Hook. by previous authors (Morton 1963; Wiehler 1973, 1975). A monographic revision of *Trichantha* by Morton (1963) was followed by another paper by the same author (Morton 1971) with a reduction of all species recognized as *Trichantha* to *Columnea*. The type species for *Trichantha* is *Columnea minor* (Hook.) Hanst. and is characterized by the presence of appendages at the sinuses of the corolla (Fig. 3C, D). It is important to note that corolla appendages are not a unifying character for section *Ortholoma* or genus *Trichantha*. The type species for section *Ortholoma* is *Columnea anisophylla* DC., which lacks corolla appendages as do many other species that have been assigned to this section. The traditional sectional classification of *Columnea* has been shown to be artificial because many sections do not represent monophyletic lineages (Smith 1994; Smith & Sytsma 1994; Clark et al. 2006). A revised sectional classification system based on molecular sequence data is currently a collaborative research focus by numerous authors (e.g., James Smith, John L. Clark, Lacie Schulte and others).

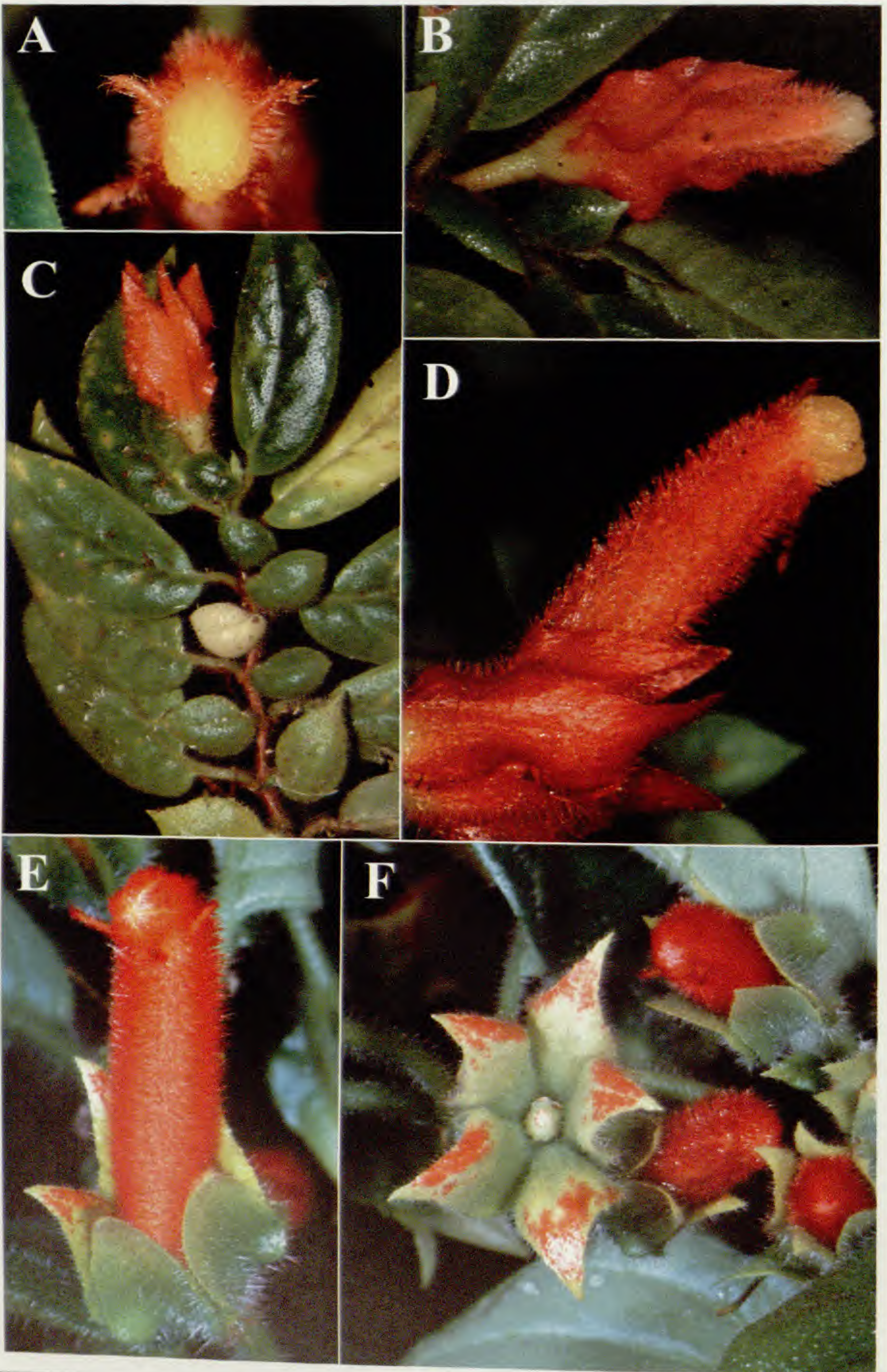


FIG. 2. *Columnnea dissimilis* C.V. Morton (A–D) and *C. filamentosa* L.E. Skog (E–F). A. Front view of flower showing corolla appendages. B. Lateral view of immature flower. C. Habit showing anisophyllous leaf arrangement. D. Lateral view of flower. E. Lateral view of flower. F. Mature calyx showing dorsal nectary gland. (Photos A & D from J.L. Clark 8629; B from J.L. Clark & J. de Gracia 12451; C from J.L. Clark & A. Zapata 12495; D & F from H. Wiehler et al. 1631 field collection that was cultivated and then vouchered for the holotype).

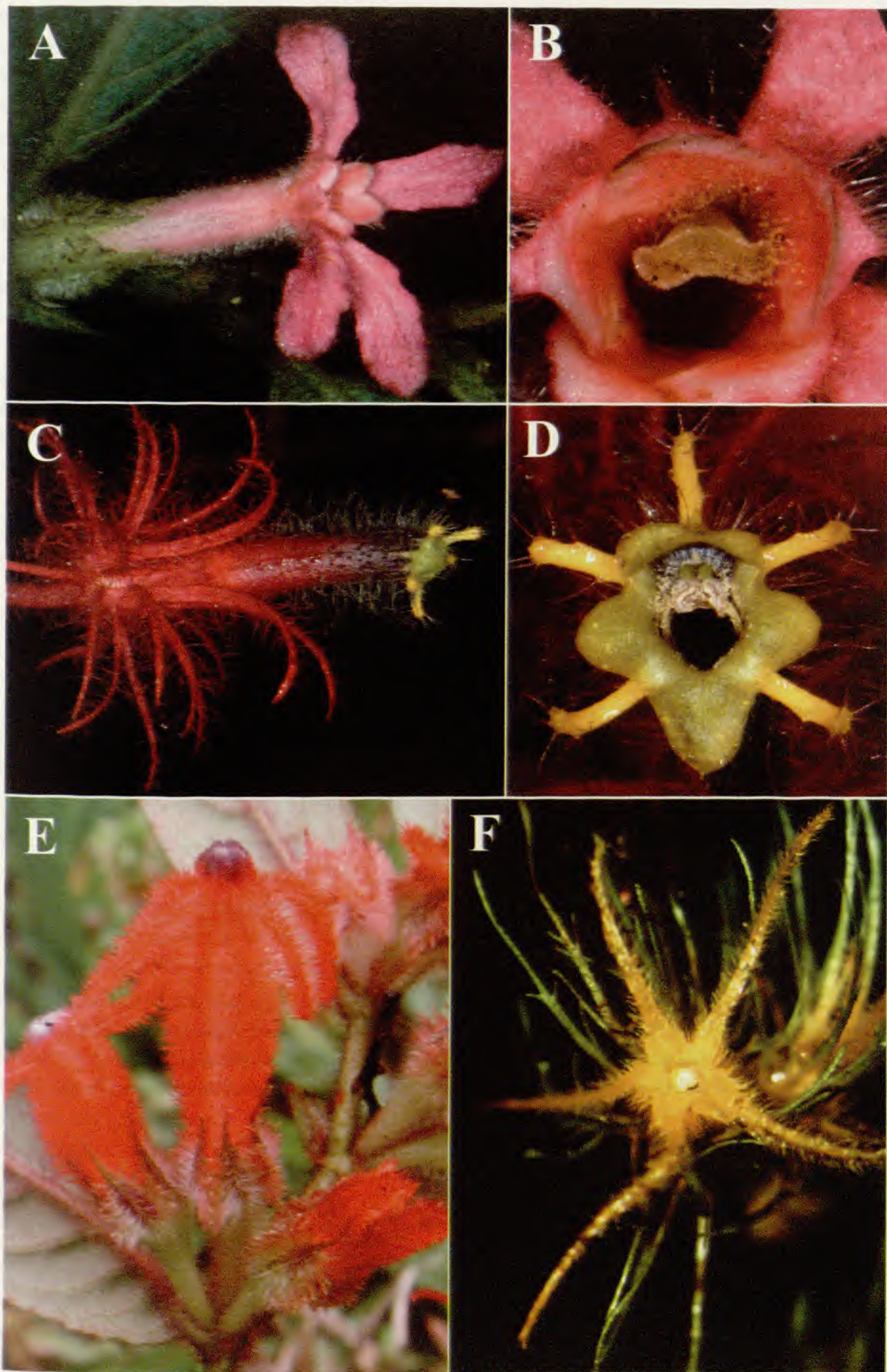


FIG. 3. Variation in corolla appendages present in *Columnea*. A & B. *Columnea coronata* Amaya, L.E. Skog & L.P. Kvist. C & D. *Columnea minor* (Hook.) Hanst. E. *Columnea rosea* (C.V. Morton) C.V. Morton. F. *Columnea filifera* (Wiehler) L.E. Skog & L.P. Kvist. (Photos A & B from J.L. Clark et al. 12990; C from J.L. Clark et al. 10870; D from J.L. Clark et al. 9647; E from J. Betancur 12394; F from J.L. Clark et al. 7140).

Corolla appendages vs. corolla lobes.—The presence of corolla appendages is widespread in *Columnea* and this character is often not accurately distinguished from corolla lobes. Various taxa from different sections have corolla appendages and this character is probably convergent within *Columnea*. For example, *Columnea filifera* (Fig. 3F) has been assigned to section *Collandra* Lem. (Kvist & Skog 1993) and genus *Dalbergaria* Tussac. (Wiehler 1992; Kvist & Skog 2004) because of sessile leaves, dorsiventral shoots, and a facultative epiphytic habit. A recently described species, *Columnea coronata* Amaya, L.E. Skog & L. P. Kvist, was assigned to section *Collandra* (Amaya et al. 2004), where the specific epithet refers to a “corona” at the apex of the corolla tube. More accurately, the “corona” in *Columnea coronata* is homologous to reduced corolla lobes like those found in *Columnea antennifera*. Thus, what Amaya et al. (2004) referred to as “petals” in the description of *Columnea coronata* are actually appendages that appear petaloid (Fig. 3A) and what was described in Amaya et al. (2004) as the “corona” is homologous to reduced corolla lobes. Another species that has reduced corolla lobes and petaloid appendages is *Columnea filifera* (Fig. 3F). The petaloid appendages in *Columnea filifera* (Fig. 3F) are visible in the field and in photographs, but the corolla lobes are only visible with a hand lens or microscope. Phylogenetic studies on the evolution of corolla appendages and their presence in numerous lineages of *Columnea* will play an important role in understanding their function, homology, and role in plant-pollinator interactions.

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